


```
WW      WW      000000      RRRRRRRR      KK      KK      QQQQQQ
WW      WW      000000      RRRRRRRR      KK      KK      QQQQQQ
WW      WW      00      00      RR      RR      KK      KK      QQ      QQ
WW      WW      00      00      RR      RR      KK      KK      QQ      QQ
WW      WW      00      00      RR      RR      KK      KK      QQ      QQ
WW      WW      00      00      RR      RR      KK      KK      QQ      QQ
WW      WW      00      00      RRRRRRRR      KKKKKK      QQ      QQ
WW      WW      00      00      RRRRRRRR      KKKKKK      QQ      QQ
WW      WW      00      00      RR      RR      KK      KK      QQ      QQ
WW      WW      00      00      RR      RR      KK      KK      QQ      QQ
WW      WW      00      00      RR      RR      KK      KK      QQ      QQ
WW      WW      00      00      RR      RR      KK      KK      QQ      QQ
WW      WW      00      00      RR      RR      KK      KK      QQ      QQ
WW      WW      000000      RR      RR      KK      KK      QQQQ      QQ
WW      WW      000000      RR      RR      KK      KK      QQQQ      QQ
                                     ....
                                     ....
                                     ....
                                     ....
```

```
LL      IIIIII      SSSSSSSS
LL      IIIIII      SSSSSSSS
LL      II      SS
LL      II      SS
LL      II      SS
LL      II      SS
LL      II      SSSSSS
LL      II      SSSSSS
LL      II      SS
LL      II      SS
LL      II      SS
LL      II      SS
LLLLLLLLLL      IIIIII      SSSSSSSS
LLLLLLLLLL      IIIIII      SSSSSSSS
```



```
1 0001 0 MODULE workq (IDENT = 'V04-000') =
2 0002 1 BEGIN
3 0003 1
4 0004 1
5 0005 1 *****
6 0006 1 *
7 0007 1 * COPYRIGHT (c) 1978, 1980, 1982, 1984 BY
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23 0023 1 * SOFTWARE ON EQUIPMENT WHICH IS NOT SUPPLIED BY DIGITAL.
24 0024 1 *
25 0025 1 *
26 0026 1 *****
27 0027 1
28 0028 1 ++
29 0029 1 FACILITY: DECnet V2.0 event logger
30 0030 1
31 0031 1 ABSTRACT:
32 0032 1
33 0033 1 This module contains routines to manage the internal
34 0034 1 work queue.
35 0035 1
36 0036 1 ENVIRONMENT:
37 0037 1
38 0038 1 VAX/VMS operating system. unprivileged user mode,
39 0039 1
40 0040 1 AUTHOR: Tim Halvorsen, June 1980
41 0041 1
42 0042 1 Modified by:
43 0043 1
44 0044 1 V03-001 RPG0001 Bob Grosso 24-Feb-1983
45 0045 1 Make two minor fixes. There was one place where a
46 0046 1 deallocate_vm was done before the REMQUE, and another
47 0047 1 where there was no deallocation after the REMQUE.
48 0048 1 --
49 0049 1
50 0050 1
51 0051 1 Include files
52 0052 1
53 0053 1
54 0054 1 LIBRARY 'SYS$LIBRARY:STARLET'; ! VAX/VMS common definitions
55 0055 1
56 0056 1 REQUIRE 'SYS$LIBRARY:UTILDEF'; ! Misc. VMS definitions
57 0232 1
```

WORKQ
V04-000

; 58

0233 1 REQUIRE 'LIB\$:WQDEF';

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! Structure definitions

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```

60 0296 1 |
61 0297 1 | Table of contents
62 0298 1 |
63 0299 1 |
64 0300 1 FORWARD ROUTINE
65 0301 1     wkq$add_work_item,      | Add a work item
66 0302 1     wkq$do_work_item,    | Dequeue and execute a work item
67 0303 1     wkq$add_timed_work,  | Add a timed work item
68 0304 1     wkq$cancel_timed_work, | Cancel timed work item
69 0305 1     timer_ast:           NOVALUE; | Timer AST routine
70 0306 1 |
71 0307 1 |
72 0308 1 | BUILTIN functions
73 0309 1 |
74 0310 1 |
75 0311 1 BUILTIN
76 0312 1     INSQUE,              | INSQUE instruction
77 0313 1     REMQUE;             | REMQUE instruction
78 0314 1 |
79 0315 1 |
80 0316 1 | OWN storage
81 0317 1 |
82 0318 1 |
83 0319 1 OWN
84 0320 1     work_queue:          VECTOR [2]      | Work queue listhead
85 0321 1     INITIAL(work_queue,work_queue),
86 0322 1     timed_queue:         VECTOR [2]      | Timed work queue listhead
87 0323 1     INITIAL(timed_queue,timed_queue);
88 0324 1 |
89 0325 1 |
90 0326 1 | External routines
91 0327 1 |
92 0328 1 |
93 0329 1 EXTERNAL ROUTINE
94 0330 1     lib$get_vm: ADDRESSING_MODE(GENERAL), | Allocate storage
95 0331 1     lib$free_vm: ADDRESSING_MODE(GENERAL); | Deallocate storage

```



```

: 97 0332 1 GLOBAL ROUTINE wkq$add_work_item (action_routine, arg1, arg2) =
: 98 0333 1
: 99 0334 1 ---
100 0335 1
101 0336 1 This routine adds a single work item to the work queue.
102 0337 1 A $WAKE is performed for the first work item added.
103 0338 1
104 0339 1 Inputs:
105 0340 1
106 0341 1 action_routine = Address of routine to call to perform work.
107 0342 1 arg1/2 = Arguments to be passed to action routine when called.
108 0343 1
109 0344 1 Outputs:
110 0345 1
111 0346 1 routine = status code
112 0347 1 ---
113 0348 1
114 0349 2 BEGIN
115 0350 2
116 0351 2 LOCAL
117 0352 2 length, ! Length of allocate/deallocation
118 0353 2 entry: REF BBLOCK; ! Address of work queue entry
119 0354 2
120 0355 2 length = wqe$c_length; ! Length of a work queue entry
121 0356 2 return_if_error(LIB$GET_VM(length,entry)); ! Allocate entry
122 0357 2 CH$FILL(0,wqe$c_length,.entry); ! Zero the entry
123 0358 2
124 0359 2 entry[wqe$l_pc] = .action_routine; ! Store address of action routine
125 0360 2 entry[wqe$l_arg1] = .arg1; ! then store 2 arguments
126 0361 2 entry[wqe$l_arg2] = .arg2; ! assume both arguments must be given
127 0362 2
128 0363 2 IF INSQUE(.entry, .work_queue [1]) ! Queue entry at tail of list
129 0364 2 THEN
130 0365 2 $WAKE(); ! If first, wakeup process
131 0366 2
132 0367 2 RETURN true;
133 0368 2
134 0369 1 END;
```

```
.TITLE WORKQ
.IDENT \V04-000\
```

```
.PSECT $OWNS$,NOEXE,2
```

```
00000000' 00000000' 00000 WORK_QUEUE:
```

```
.ADDRESS WORK_QUEUE, WORK_QUEUE
```

```
00000000' 00000000' 00008 TIMED_QUEUE:
```

```
.ADDRESS TIMED_QUEUE, TIMED_QUEUE
```

```
.EXTRN LIB$GET_VM, LIB$FREE_VM
```

```
.EXTRN SYSSWAKE
```

```
.PSECT $CODE$,NOWRT,2
```

```
SE 007C 00000
08 C2 00002
```

```
.ENTRY WKQ$ADD_WORK_ITEM, Save R2,R3,R4,R5,R6
SUBL2 #8, SP
```

```
: 0332
:
```


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04	AE	18	D0	00005	MOVL	#24, LENGTH	:	0355
		5E	DD	00009	PUSHL	SP	:	0356
		08	AE	9F 0000B	PUSHAB	LENGTH	:	
00000000G	00	02	FB	0000E	CALLS	#2, LIB\$GET_VM	:	
	26	50	E9	00015	BLBC	STATUS, 2\$	:	
	56	6E	D0	00018	MOVL	ENTRY, R6	:	0357
18	00	00	2C	0001B	MOVCS	#0, (SP), #0, #24, (R6)	:	
		66		00020			:	
	08	04	AC	7D 00021	MOVQ	ACTION_ROUTINE, 8(R6)	:	0359
	10	0C	AC	D0 00026	MOVL	ARG2, T6(R6)	:	0361
0000'	DF	66	0E	0002B	INSQUE	(R6), @WORK_QUEUE+4	:	0363
		09	12	00030	BNEQ	1\$	:	
		7E	7C	00032	CLRQ	-(SP)	:	0365
00000000G	00	02	FB	00034	CALLS	#2, SYSSWAKE	:	
	50	01	D0	0003B 1\$:	MOVL	#1, R0	:	0367
		04	00	0003E 2\$:	RET		:	0369

; Routine Size: 63 bytes, Routine Base: \$CODE\$ + 0000


```
136 0370 1 GLOBAL ROUTINE wkq$do_work_item =
137 0371 1
138 0372 1 ---
139 0373 1
140 0374 1 This routine dequeues the next work item to be performed
141 0375 1 and calls the action routine associated with the item.
142 0376 1
143 0377 1 Inputs:
144 0378 1
145 0379 1 None
146 0380 1
147 0381 1 Outputs:
148 0382 1
149 0383 1 routine = True if successful, false if nothing in queue
150 0384 1 ---
151 0385 1
152 0386 2 BEGIN
153 0387 2
154 0388 2 LOCAL
155 0389 2 length, ! Length of work queue entry
156 0390 2 entry: REF BBLOCK; ! Address of entry in queue
157 0391 2
158 0392 2 IF REMQUE(.work_queue [0], entry) ! Remove first entry from queue
159 0393 2 THEN
160 0394 2 RETURN false; ! If none, return unsuccessful
161 0395 2
162 0396 2 (.entry [wqe$l_pc])(.entry [wqe$l_arg1], .entry [wqe$l_arg2]); ! Call routine
163 0397 2
164 0398 2 length = wqe$c_length;
165 0399 2 LIB$FREE_VM(length, entry); ! Deallocate entry
166 0400 2
167 0401 2 RETURN true;
168 0402 2
169 0403 1 END;
```

			0000 0000	.ENTRY WKQ\$DO_WORK_ITEM, Save nothing	: 0370
	5E		04 C2 00002	SUBL2 #4, SP	
	7E	0000'	DF 0F 00005	REMQUE @WORK_QUEUE, ENTRY	: 0392
			1F 1D 0000A	BVS 1\$	
	50		6E D0 0000C	MOVL ENTRY, R0	: 0396
	7E	0C	A0 7D 0000F	MOVQ 12(R0), -(SP)	
08	B0		02 FB 00013	CALLS #2, @8(R0)	
04	AE		18 D0 00017	MOVL #24, LENGTH	: 0398
		08	5E DD 0001B	PUSHL SP	: 0399
			AE 9F 0001D	PUSHAB LENGTH	
00000000G	00		02 FB 00020	CALLS #2, LIB\$FREE_VM	
	50		01 D0 00027	MOVL #1, R0	: 0401
			04 0002A	RET	
		50	D4 0002B 1\$:	CLRL R0	: 0403
			04 0002D	RET	

; Routine Size: 46 bytes, Routine Base: \$CODE\$ + 003F

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LPN

%SE

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a


```
171 0404 1 GLOBAL ROUTINE wkq$add_timed_work (action_routine, arg1, arg2, time, reqid) =
172 0405 1
173 0406 1 ---
174 0407 1
175 0408 1 This routine adds a timed work item to the work queue
176 0409 1 to be executed at the specified time. Any outstanding
177 0410 1 work item for the same reqid is canceled before the new
178 0411 1 one is added.
179 0412 1
180 0413 1 Inputs:
181 0414 1
182 0415 1 action_routine = Address of routine to call to perform work.
183 0416 1 arg1/2 = Arguments to be passed to action routine when called.
184 0417 1 time = Delta or absolute time at which the work item should be done.
185 0418 1 reqid = Request identification to be associated with the time based
186 0419 1 work item. There may be no more than one work item in the
187 0420 1 work queue with this request id.
188 0421 1
189 0422 1 Outputs:
190 0423 1
191 0424 1 routine = status code
192 0425 1 ---
193 0426 1
194 0427 2 BEGIN
195 0428 2
196 0429 2 LOCAL
197 0430 2 status,
198 0431 2 length,
199 0432 2 entry: REF BBLOCK,
200 0433 2 p: REF BBLOCK;
201 0434 2
202 0435 2 length = wqe$length;
203 0436 2 return_if_error(LIB$GET_VM(length,entry));
204 0437 2 CH$FILL(0,wqe$length,entry);
205 0438 2
206 0439 2 entry[wqe$l_pc] = .action_routine;
207 0440 2 entry[wqe$l_arg1] = .arg1;
208 0441 2 entry[wqe$l_arg2] = .arg2;
209 0442 2 entry[wqe$l_reqid] = .reqid;
210 0443 2
211 0444 2 wkq$cancel_timed_work(.reqid);
212 0445 2
213 0446 2 INSQUE(.entry, .timed_queue[1]);
214 0447 2
215 0448 2 status = $SETIMR(DAYTIM=.time, ASTADR=timer_ast, REQIDT=.reqid);
216 0449 2
217 0450 2 IF NOT .status
218 0451 2 THEN
219 0452 2 BEGIN
220 0453 2 REMQUE(.entry, entry);
221 0454 2 LIB$FREE_VM(length,entry);
222 0455 2 RETURN .status;
223 0456 2 END;
224 0457 2
225 0458 2 RETURN true;
226 0459 2
227 0460 1 END;
```


				007C 00000	.EXTRN	SYSS\$SETIMR		
				08 C2 00002	.ENTRY	WKQ\$ADD_TIMED_WORK, Save R2,R3,R4,R5,R6	:	0404
	04	5E		18 D0 00005	SUBL2	#8, SP	:	
		AE		5E DD 00009	MOVL	#24, LENGTH	:	0435
			08	AE 9F 0000B	PUSHL	SP	:	0436
	00000000G	00		02 FB 0000E	PUSHAB	LENGTH	:	
		54		50 E9 00015	CALLS	#2, LIB\$GET_VM	:	
		56		6E D0 00018	BLBC	STATUS, 2\$	:	
18	00	6E		00 2C 0001B	MOVL	ENTRY, R6	:	0437
				66 00020	MOVC5	#0, (SP), #0, #24, (R6)	:	
	08	A6	04	AC 7D 00021	MOVQ	ACTION_ROUTINE, 8(R6)	:	0439
	10	A6	0C	AC D0 00026	MOVL	ARG2, T6(R6)	:	0441
	14	A6	14	AC D0 0002B	MOVL	REQID, 20(R6)	:	0442
			14	AC DD 00030	PUSHL	REQID	:	0444
	0000V	CF		01 FB 00033	CALLS	#1, WKQ\$CANCEL_TIMED_WORK	:	
	0000'	DF		66 0E 00038	INSQUE	(R6), @TIMED_QUEUE+4	:	0446
			14	AC DD 0003D	PUSHL	REQID	:	0448
			0000V	CF 9F 00040	PUSHAB	TIMER_AST	:	
			10	AC DD 00044	PUSHL	TIME	:	
				7E D4 00047	CLRL	-(SP)	:	
	00000000G	00		04 FB 00049	CALLS	#4, SYSS\$SETIMR	:	
		52		50 D0 00050	MOVL	R0, STATUS	:	
		13		52 E8 00053	BLBS	STATUS, 1\$	:	0450
		7E		9E 0F 00056	REMQUE	@ENTRY, ENTRY	:	0453
				5E DD 00059	PUSHL	SP	:	0454
			08	AE 9F 0005B	PUSHAB	LENGTH	:	
	00000000G	00		02 FB 0005E	CALLS	#2, LIB\$FREE_VM	:	
		50		52 D0 00065	MOVL	STATUS, R0	:	0455
				04 00068	RET		:	
		50		01 D0 00069 1\$:	MOVL	#1, R0	:	0458
				04 0006C 2\$:	RET		:	0460

; Routine Size: 109 bytes, Routine Base: \$CODE\$ + 006D


```
229 0461 1 GLOBAL ROUTINE wkq$cancel_timed_work (reqid) =
230 0462 1
231 0463 1 ---
232 0464 1
233 0465 1 This routine cancels a timed work item in the work queue
234 0466 1 from being executed at the specified time.
235 0467 1
236 0468 1 Inputs:
237 0469 1
238 0470 1 reqid = Request identification associated with the work item.
239 0471 1
240 0472 1 Outputs:
241 0473 1
242 0474 1 routine = True if request dequeued, false if not found in work queue.
243 0475 1 ---
244 0476 1
245 0477 2 BEGIN
246 0478 2
247 0479 2 LOCAL
248 0480 2 length,
249 0481 2 p: REF BBLOCK; ! Address of entry being scanned
250 0482 2
251 0483 2 length = wqe$length; ! Length of a work queue entry
252 0484 2 p = .timed_queue [0]; ! Get at first entry in timed queue
253 0485 2
254 0486 2 WHILE .p NEQ timed_queue [0] ! Until the end of list
255 0487 2 DO
256 0488 3 BEGIN
257 0489 3 IF .p [wqe$l_reqid] EQL .reqid ! If already a request with this reqid,
258 0490 3 THEN
259 0491 4 BEGIN
260 0492 4 $CANTIM(REQIDT=.reqid); ! Cancel the previous request
261 0493 4 REMQUE(.p, p); ! Remove entry from queue
262 0494 4 LIB$FREE_VM(length,p); ! Deallocate the storage
263 0495 4 RETURN true; ! Return successful
264 0496 4 END;
265 0497 3 p = .p [wqe$l_flink]; ! Skip to next in chain
266 0498 2 END;
267 0499 2
268 0500 2 RETURN false; ! Indicate request not in work queue
269 0501 2
270 0502 1 END;
```

					.EXTRN	SYSSCANTIM		
			0004	00000	.ENTRY	WKQ\$CANCEL_TIMED_WORK, Save R2	:	0461
			18	DD 00002	PUSHL	#24	:	0483
		0000'	CF	DD 00004	PUSHL	TIMED_QUEUE	:	0484
	52		6E	D0 00008	MOVL	P, R2	:	0486
	50	0000'	CF	9E 0000B	MOVAB	TIMED_QUEUE, R0	:	
	50		52	D1 00010	CMPL	R2, R0	:	
			2A	13 00013	BEQL	3\$	:	
04	AC	14	A2	D1 00015	CMPL	20(R2), REQID	:	0489
			1F	12 0001A	BNEQ	2\$	:	
			7E	D4 0001C	CLRL	-(SP)	:	0492

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00000000G	00	04	AC	DD	0001E	PUSHL	REQID	:	
	6E		02	FB	00021	CALLS	#2, SYSSCANTIM	:	
			62	OF	00028	REMQUE	(R2), P	:	0493
			5E	DD	00028	PUSHL	SP	:	0494
		08	AE	9F	0002D	PUSHAB	LENGTH	:	
00000000G	00		02	FB	00030	CALLS	#2, LIB\$FREE_VM	:	
	50		01	D0	00037	MOVL	#1, R0	:	0495
				04	0003A	RET		:	
			9E	DD	0003B	PUSHL	@P	:	0497
			C9	11	0003D	BRB	1\$	:	0486
			50	D4	0003F	CLRL	R0	:	0500
			04	04	00041	RET		:	0502

; Routine Size: 66 bytes, Routine Base: \$CODE\$ + 00DA


```
272 0503 1 ROUTINE timer_ast (reqid): NOVALUE =
273 0504 1
274 0505 1 ---
275 0506 1
276 0507 1 This AST is called when a timer has run out for a work
277 0508 1 queue item. The action routine associated with the
278 0509 1 item is called.
279 0510 1
280 0511 1 Inputs:
281 0512 1
282 0513 1 reqid = Request identification for this timer request
283 0514 1
284 0515 1 Outputs:
285 0516 1
286 0517 1 None
287 0518 1 ---
288 0519 1
289 0520 2 BEGIN
290 0521 2
291 0522 2 LOCAL
292 0523 2 entry: REF BBLOCK, ! Address of work entry begin scanned
293 0524 2 length; ! Length of work queue entry
294 0525 2
295 0526 2 entry = .timed_queue [0]; ! Get first timed entry
296 0527 2
297 0528 2 WHILE .entry NEQ timed_queue [0] ! Until end of queue
298 0529 2 DO
299 0530 3 BEGIN
300 0531 3 IF .reqid EQL .entry [wqe$l_reqid] ! If matching item is found,
301 0532 3 THEN
302 0533 4 BEGIN
303 0534 4 REMQUE(!.entry, entry); ! Remove entry from queue
304 0535 4
305 0536 4 wkq$add_work_item(.entry [wqe$l_pc], ! Insert onto normal work queue
306 0537 4 .entry [wqe$l_arg1],
307 0538 4 .entry [wqe$l_arg2]);
308 0539 4
309 0540 4 length = wqe$c_length;
310 0541 4 LIB$FREE_VM(length, entry); ! Deallocate entry
311 0542 4 RETURN;
312 0543 3 END;
313 0544 3 entry = .entry [wqe$l_flink]; ! Skip to next entry in chain
314 0545 2 END;
315 0546 2
316 0547 2 !
317 0548 2 A timer has run out without a corresponding work item in the queue.
318 0549 2 Ignore the timer AST.
319 0550 2 !
320 0551 2
321 0552 2 RETURN;
322 0553 2
323 0554 1 END;
```

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LPM

```
0000 00000 TIMER_AST:
      5E      04 C2 00002      .WORD      Save nothing      : 0503
      0000'   CF DD 00005      SUBL2     #4, SP           :
      51      6E D0 00009 1$:  PUSHL     TIMED_QUEUE      : 0526
      50      CF 9E 0000C      MOVL      ENTRY, R1         : 0528
      50      51 D1 00011      MOVAB     TIMED_QUEUE, R0    :
      14      2E 13 00014      CMPL      R1, R0             :
      A1      AC D1 00016      BEQL      3$                 :
      04      23 12 0001B      CMPL      REQID, 20(R1)       : 0531
      6E      61 0F 0001D      BNEQ      2$                 :
      50      6E D0 00020      REMQUE    (R1), ENTRY        : 0534
      7E      A0 7D 00023      MOVL      ENTRY, R0           : 0538
      0C      A0 7D 00023      MOVQ      12(R0), -(SP)       : 0537
      08      A0 DD 00027      PUSHL     8(R0)              : 0536
      FEB5    CF 03 FB 0002A      CALLS    #3, WKQ$ADD_WORK_ITEM :
      04      AE 18 D0 0002F      MOVL      #24, LENGTH      : 0540
      08      5E DD 00033      PUSHL     SP               : 0541
      00      AE 9F 00035      PUSHAB   LENGTH          :
      00      02 FB 00038      CALLS    #2, LIB$FREE_VM      :
      04      04 0003F      RET              : 0533
      9E      DD 00040 2$:  PUSHL     @ENTRY              : 0544
      C5      11 00042      BRB       1$                 : 0528
      04      04 00044 3$:  RET              : 0554
```

; Routine Size: 69 bytes, Routine Base: \$CODE\$ + 011C

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: 325 0555 1 END
: 326 0556 0 ELUDOM

PSECT SUMMARY

Name	Bytes	Attributes
\$OWNS	16	NOVEC, WRT, RD, NOEXE, NOSHR, LCL, REL, CON, NOPIC, ALIGN(2)
\$CODES	353	NOVEC, NOWRT, RD, EXE, NOSHR, LCL, REL, CON, NOPIC, ALIGN(2)

Library Statistics

File	----- Total	Symbols Loaded	----- Percent	Pages Mapped	Processing Time
_\$255\$DUA28:[SYSLIB]STARLET.L32;1	9776	10	0	581	00:01.0

COMMAND QUALIFIERS

: BLISS/CHECK=(FIELD,INITIAL,OPTIMIZE)/LIS=LIS\$:WORKQ/OBJ=OBJ\$:WORKQ MSRC\$:WORKQ/UPDATE=(ENH\$:WORKQ)

: Size: 353 code + 16 data bytes
: Run Time: 00:08.8
: Elapsed Time: 00:17.8
: Lines/CPU Min: 3773
: Lexemes/CPU-Min: 16561
: Memory Used: 67 pages
: Compilation Complete

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